BERROW PRIMARY
Church Academy

Progression in Computing

End of Year Expectations

Computing Curriculum Intent

We believe that Computing and the use of ICT is central to the education of all children. We aim to give each pupil the opportunity to apply and develop their technological understanding and skills across a wide range of situations and tasks. Pupils are encouraged to develop a confident and safe approach to Computing and the use of ICT, with the understanding of the capabilities and flexibility of their resources. With the knowledge that Computing and ICT will undoubtedly continue to form a major part in the children's life at home, in further education and places of work, we ensure the Computing and ICT experiences and abilities that the children are equipped with, are effective and transferrable life skills.

A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.

	Development Matters 2 year olds will learn to:	**Development Matters** 3 & 4-year-olds will learn to:	**Development Matters** Children in Reception will learn to:	**Statutory Framework** Early Learning Goals
	Development Matters and Statutory ELGs are not the EYFS curriculum. This outlined a top-level view of how children develop and learn. Children's early learning is not neat and orderly, as such these are used as a pathway to help practitioners assess each child's level of development and make informed decisions about what a child needs to learn and be able to do next.			
Communication and Language	Reach or point to something they want while making sounds. Copy your gestures and words. Understand simple instructions like. 'go' and 'stop'. Recognise and point to objects if asked about them. Understand simple questions about 'who', 'what' and 'where' (but generally not 'why.	Pay attention to more than one thing at a time, which can be difficult. Use talk to organise themselves and their play: "Let's go on a bus... you sit there... I'll be the driver." Understand and ask 'why' questions.	Use new vocabulary throughout the day. Ask questions to find out more and to check they understand what has been said to them. Articulate their thoughts and ideas in well-formed sentences. Use talk to help work out problems and organise thinking and activities and to explain how things work and why they might happen. Articulate their thoughts and ideas in well-formed sentences. - Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen.	**Listening, Attention and Understanding** Listen attentively and respond to what they hear with relevant questions, comments and actions when being read to and during whole class discussions and small group interactions. **Speaking** Listen attentively and respond to what they hear with relevant questions, comments and actions when being read to and during whole class discussions and small group interactions. Offer explanations for why things might happen. Express their ideas and feelings about their experiences using full sentences.

Mathematics	Climb and squeeze themselves into different types of spaces. Build with a range of resources. Complete inset puzzles. Climb and squeeze themselves into different types of spaces. Build with a range of resources. Complete inset puzzles. Notice patterns and arrange things in patterns.	Talk about and identify the patterns around them. Extend and create ABAB patterns – stick, leaf, stick, leaf. Notice and correct an error in a repeating pattern. Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...' Combine shapes to make new ones – an arch, a bigger triangle, etc. Describe a familiar route. Discuss routes and locations, using words like 'in front of' and 'behind'.	Subitise. Link the number symbol (numeral) with its cardinal number value. Continue, copy and create repeating patterns. Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity	**Numerical Patterns** Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity. Count objects, actions and sounds. Link the number symbol (numeral) with its cardinal number value.

	Information Technology	Computer Science	Digital Literacy
Reception	• Using a simple online paint tool to create digital art. • Representing data through sorting and categorising objects in unplugged scenarios. • Exploring branch databases through physical games.	• Learning how to operate a camera to take photographs of meaningful creations or moments. • Learning how to explore and tinker with hardware to develop familiarity and introduce relevant vocabulary. • Recognising and identifying familiar letters and numbers on a keyboard. • Developing basic mouse skills such as moving and clicking	• Recognising that a range of technology is used for different purposes. • Learning to log in and log out.

Key stage 1 Pupils should be taught to:

♣ understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.

♣ create and debug simple programs.

♣ use logical reasoning to predict the behaviour of simple programs.

♣ use technology purposefully to create, organise, store, manipulate and retrieve digital content.

♣ recognise common uses of information technology beyond school.

♣ use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.

	Information Technology	Computer Science	Digital Literacy
Year 1	• Using a basic range of tools within graphic editing software. • Taking and editing photographs. • Developing control of the mouse through dragging, clicking and resizing of images to create different effects. • Developing understanding of different software tools. • Recognising devices that are connected to the internet. • Understanding that we are connected to others when using the internet. • Recognising common uses of information technology, including beyond school. • Understanding some of the ways we can use the internet.	• Learning how to operate a camera or tablet to take photos and videos. • Learning how to explore and tinker with hardware to find out how it works. Learning where keys are located on the keyboard.	• Logging in and out and saving work on their own account. • When using the internet to search for images, learning what to do if they come across something online that worries them or makes them feel uncomfortable. • Understanding how to interact safely with others online. • Recognising how actions on the internet can affect others. • Recognising what a digital footprint is and how to be careful about what we post.

Year 2	• Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts. • Using word processing software to type and reformat text. • Using software (and unplugged means) to create story animations. Creating and labelling images. • Searching for appropriate images to use in a document • Collecting and inputting data into a spreadsheet. • Interpreting data from a spreadsheet. • Learning how computers are used in the wider world.	• Understanding what a computer is and that it's made up of different components. Recognising that buttons cause effects and that technology follows instructions. • Learning how we know that technology is doing what we want it to do via its output. • Developing confidence with the keyboard and the basics of touch typing.	• Learning how to create a strong password. • Understanding how to stay safe when talking to people online and what to do if they see or hear something online that makes them feel upset or uncomfortable • Identifying whether information is safe or unsafe to be shared online. • Learning to be respectful of others when sharing online and ask for their permission before sharing content. • Learning strategies for checking if something they read online is true.

Key stage 2 Pupils should be taught to:

♣ design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.

♣ use sequence, selection, and repetition in programs; work with variables and various forms of input and output.

♣ use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.

♣ understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration.

♣ use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.

♣ select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.

♣ use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

	Information Technology	**Computer Science**	**Digital Literacy**
Year 3	• Taking photographs and recording video to tell a story. Using software to edit and enhance their video adding music, sounds and text on screen with transitions. • Recognising how social media platforms are used to interact.	• Using decomposition to explain the parts of a laptop computer. • Using decomposition to explore the code behind an animation. • Using repetition in programs. Using logical reasoning to explain how simple algorithms work. • Explaining the purpose of an algorithm. Forming algorithms independently. • Using logical thinking to explore more complex software; predicting, testing and explaining what it does. • Incorporating loops to make code more efficient. Continuing existing code. • Understanding what the different components of a computer do and how they work together. • Drawing comparisons across different types of computers. • Learning about the purpose of routers. • Understanding the role of the key components of a network. Identifying the key components within a network, including whether they are wired or wireless. • Understanding that websites and videos are files that are shared from one computer to another. Learning about the role of packets.	• Recognising that different information is shared online including facts, beliefs and opinions. Learning how to identify reliable information when searching online. • Learning how to stay safe on social media. Considering the impact technology can have on mood. • Learning about cyberbullying. Learning that not all emails are genuine, recognising when an email might be fake and what to do about it.

		• Understanding how networks work and their purpose. • Recognising links between networks and the internet. Learning how data is transferred.	
Year 4	• Use online software for documents, presentations, forms and spreadsheets. • Using software to work collaboratively with others. • Understanding why some results come before others when searching. • Understanding that information found by searching the internet is not all grounded in fact. • Searching the internet for data. • Understanding that data is used to forecast weather. • Recording data in a spreadsheet independently. Sorting data in a spreadsheet to compare using the 'sort by…' option. • Designing a device which gathers and records sensor data. • Understanding that software can be used collaboratively online to work as a team.	• Using decomposition to solve a problem by finding out what code was used. Using decomposition to understand the purpose of a script of code. • Identifying patterns through unplugged activities. • Using abstraction to identify the important parts when completing both plugged and unplugged activities. • Creating algorithms for a specific purpose. • Coding a simple game. Using abstraction and pattern recognition to modify code. • Incorporating variables to make code more efficient. • Using tablets or digital cameras to film a weather forecast. • Understanding that weather stations use sensors to gather and record data which predicts the weather. • Understanding that computer networks provide multiple services, such as the World Wide Web, and opportunities for communication and collaboration.	• Recognising that information on the internet might not be true or correct and that some sources are more trustworthy than others. • Learning to make judgements about the accuracy of online searches. Identifying forms of advertising online. • Recognising what appropriate behaviour is when collaborating with others online. • Reflecting on the positives and negatives of time spent online. Identifying respectful and disrespectful online behaviour.
Year 5	• Using logical thinking to explore software more independently, making predictions based on their previous experience. • Using software programme Sonic Pi/Scratch to create music. • Using the video editing software to animate. • Identify ways to improve and edit programs, videos, images etc. Independently learning how to use 3D design software package TinkerCAD. • Developing searching skills to help find relevant information on the internet. • Understanding how data is collected in remote or dangerous places. • Understanding how data might be used to tell us about a location. • Learn about different forms of communication that have developed with the use of technology.	• Decomposing animations into a series of images. • Decomposing a story to be able to plan a program to tell a story. Predicting how software will work based on previous experience. • Writing more complex algorithms for a purpose. • Iterating and developing their programming as they work. Confidently using loops in their programming. • Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected. • Writing code to create a desired effect. Using a range of programming commands. Using repetition within a program. • Learning that external devices can be programmed by a separate computer. • Learning the vocabulary associated with data: data and transmit. • Recognising that computers transfer data in binary and understanding simple binary addition. • Learning that messages can be sent by binary code, reading binary up to eight characters and carrying out binary calculations.	• Identifying possible dangers online and learning how to stay safe. • Evaluating the pros and cons of online communication. • Recognising that information on the internet might not be true or correct and learning ways of checking validity. • Learning what to do if they experience bullying online. • Learning to use an online community safely

Year 6	• Using logical thinking to explore software independently, iterating ideas and testing continuously. • Using search and word processing skills to create a presentation. • Understanding how search engines work. • Understanding how barcodes, QR codes and RFID work. • Gathering and analysing data in real time. • Creating formulas and sorting data within spreadsheets. • Learning how 'big data' can be used to solve a problem or improve efficiency.	• Decomposing a program into an algorithm. • Using past experiences to help solve new problems. • Writing increasingly complex algorithms for a purpose. • Debugging quickly and effectively to make a program more efficient. Remixing existing code to explore a problem. • Using and adapting nested loops. Programming using the language Python. • Changing a program to personalise it. Evaluating code to understand its purpose. • Predicting code and adapting it to a chosen purpose. • Learning about the history of computers and how they have evolved over time. Using the understanding of historic computers to design a computer of the future. • Understanding and identifying barcodes, QR codes and RFID. • Identifying devices and applications that can scan or read barcodes, QR codes and RFID.	• Learning about the positive and negative impacts of sharing online. • Learning strategies to create a positive online reputation. • Understanding the importance of secure passwords and how to create them. Learning strategies to capture evidence of online bullying in order to seek help. • Using search engines safely and effectively. • Recognising that updated software can help to prevent data corruption and hacking.

Computing systems and networks

EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
To be able to understand what a computer keyboard is and recognising some letters and numbers. To know that a mouse can be used to click, drag and create simple drawings. To know that to use a computer you need to log in to it and then log out at the end of your session. To know that different types of technology can be found at home and in school. To know that you can take simple photographs with a camera or iPad. To know that you must hold the camera still and ensure the subject is in the shot to take a photo.	To know that "log in and log out" means to begin and end a connection with a computer. To know that a computer and mouse can be used to click, drag, fill and select and also add backgrounds, text, layers, shapes and clip art. To know that passwords are important for security. To know that when we create something on a computer it can be more easily saved and shared than a paper version. To know some of the simple graphic design features of a piece of online software.	To know the difference between a desktop and laptop computer. To know that people control technology. To know that buttons are a form of input that give a computer an instruction about what to do (output). To know that computers often work together.	To know what a tablet is and how it is different from a laptop/desktop computer. To understand what a network is and how a school network might be organised. To know how the internet uses networks to share files. To know what a packet is and why it is important for website data transfer. To know the roles that inputs and outputs play on computers. To know what some of the different components inside a computer are e.g. CPU, RAM, hard drive, and how they work together.	To understand that software can be used collaboratively online to work as a team. To know that you can use images, text, transitions and animation in presentation slides.	To know how search engines work. To understand that anyone can create a website and therefore we should take steps to check the validity of websites. To understand what copyright is. To know the difference between ROM and RAM	To understand the importance of having a secure password and what "brute force hacking" is. To know that the first computers were created at Bletchley Park to crack the Enigma code to help the war effort in World War 2.

Programming

EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
To know that being able to follow and give simple instructions is important in computing. To understand that it is important for instructions to be in the right order. To understand why a set of instructions may have gone wrong.	To understand that an algorithm is when instructions are put in an exact order. To understand that decomposition means breaking a problem into manageable chunks and that it is important in computing. To know that we call errors in an algorithm 'bugs' and fixing these 'debugging'. To understand the basic functions of a Bee-Bot. To know that you can use a camera/tablet to make simple videos. To know that algorithms move a bee-bot accurately to a chosen destination.	To understand what machine learning is and how that enables computers to make predictions. To know that abstraction is the removing of unnecessary detail to help solve a problem. To know that coding is writing in a special language so that the computer understands what to do. To understand that the character in ScratchJr is controlled by the programming blocks. To know that you can write a program to create a musical instrument or tell a joke.	To know that Scratch is a programming language and some of its basic functions. To understand how to use loops to improve programming. To understand how decomposition is used in programming. To understand that you can remix and adapt existing code.	To understand that a variable is a value that can change (depending on conditions) and know that you can create them in Scratch. To know what a conditional statement is in programming. To understand that pattern recognition means identifying patterns to help them work out how the code works. To understand that algorithms can be used for a number of purposes e.g. animation, games design etc.	To know that a soundtrack is music for a film/video and that one way of composing these is on programming software. To understand that using loops can make the process of writing music simpler and more effective.	To know that there are text-based programming languages such as Logo and Python. To know that nested loops are loops inside of loops.

Creating Media

EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
	To understand that holding the camera still and considering angles and light are important to take good pictures. To know that you can edit, crop and filter photographs. To know how to search safely for images online.		To know that different types of camera shots can make my photos or videos look more effective. To know that I can edit photos and videos using film editing software. To understand that I can add transitions and text to my video.		To understand that stop motion animation is an animation filmed one frame at a time using models, and with tiny changes between each photograph. To know that decomposition of an idea is important when creating stop-motion animations.	

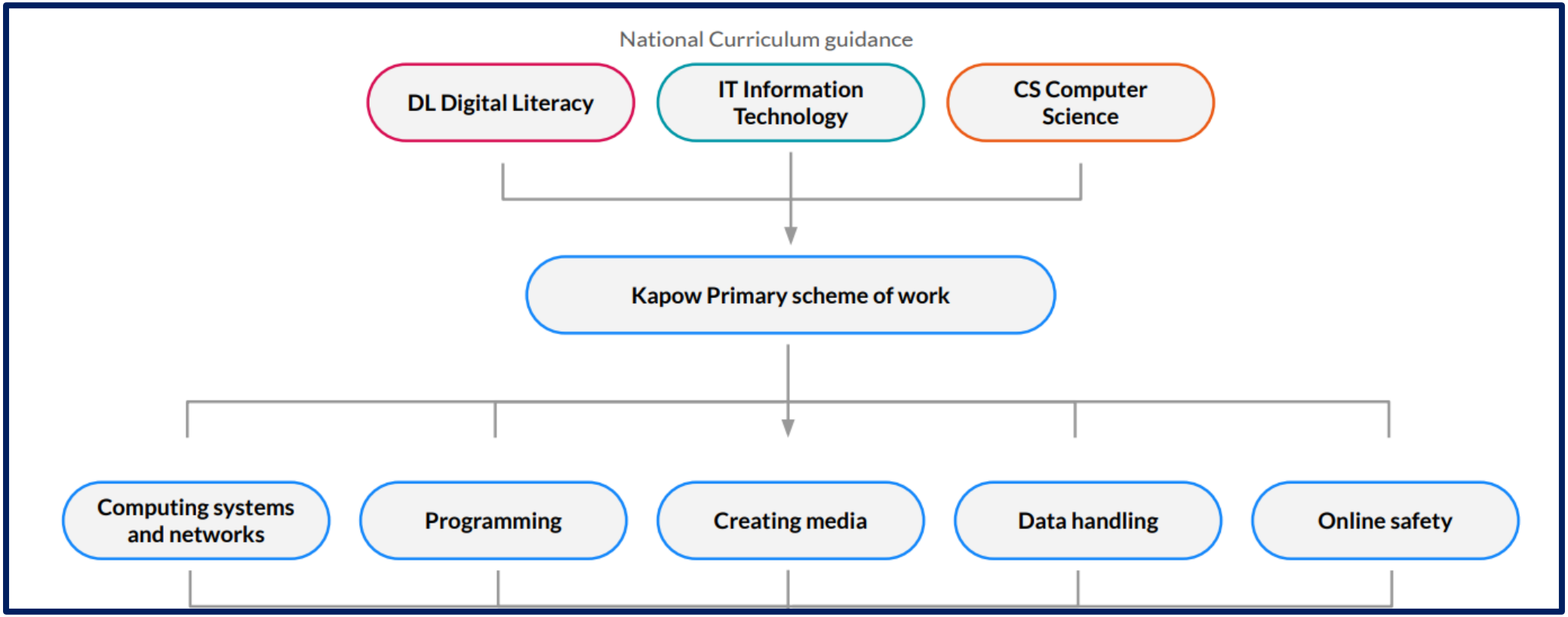
					To know that editing is an important feature of making and improving a stop motion animation.	

Data Handling

EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
To know that sorting objects into various categories can help you locate information. To know that using yes/no questions to find an answer is a branching database.		To understand that you can enter simple data into a spreadsheet. To understand what steps you need to take to create an algorithm. To know what data to use to answer certain questions. To know that computers can be used to monitor supplies.		To know that computers can use different forms of input to sense the world around them so that they can record and respond to data. This is called 'sensor data'. To know that a weather machine is an automated machine that responds to sensor data. To understand that weather forecasters use specific language, expression and pre-prepared scripts to help create weather forecast films.	To know that Mars Rover is a motor vehicle that collects data from space by taking photos and examining samples of rock. To know what numbers using binary code look like and be able to identify how messages can be sent in this format. To know what simple operations can be used to calculate bit patterns.	To know that data contained within barcodes and QR codes can be used by computers. To know that Radio Frequency Identification (RFID) is a more private way of transmitting data. To know that data is often encrypted so that even if it is stolen it is not useful to the thief.

Online Safety

YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
To know that the internet is many devices connected to one another. To know that you should tell a trusted adult if you feel unsafe or worried online. To know that people you do not know on the internet (online) are strangers and are not always who they say they are. To know that to stay safe online it is important to keep personal information safe. To know that 'sharing online means giving something specific to someone else via the internet and 'posting' online means placing information on the internet.	To understand the difference between online and offline. To understand what information I should not post online. To know what the techniques are for creating a strong password. To know that you should ask permission from others before sharing about them online and that they have the right to say 'no.' To understand that not everything I see or read online is true.	To know that not everything on the internet is true: people share facts, beliefs and opinions online. To understand that the internet can affect your moods and feelings. To know that privacy settings limit who can access your important personal information, Information, such as your name, age, gender etc. To know what social media is and that age restrictions apply.	To know that not everything on the internet is true: people share facts, beliefs and opinions online. To understand that the internet can affect your moods and feelings. To know that privacy settings limit who can access your important personal information. Information, such as your name, age, gender etc. To know what social media is and that age restrictions apply.	To know different ways we can communicate online. To understand how online information can be used to form judgements. To understand some ways to deal with online bullying. To know that apps require permission to access private information and that you can alter the permissions. To know where I can go for support if I am being bullied online or feel that my health is being affected by time online.	To know that a 'digital footprint' means the information that exists on the internet as a result of a person's online activity. To know what steps are required to capture bullying content as evidence. To understand that it is important to manage personal passwords effectively. To understand what it means to have a positive online reputation.To know some common online scams.


National Curriculum guidance
DL Digital Literacy
IT Information Technology
CS Computer Science
Kapow Primary scheme of work
Computing systems and networks
Programming
Creating media
Data handling
Online safety

Condensed Planning Coverage

EYFS	**Computing systems and networks**	**Programming**	**Computing systems and networks**	**Data handling**	**N/A**
	Using a computer (All 5 lessons)	All about instructions (All 5 lessons)	Exploring hardware (4 lessons: 1-4 only)	Introduction to data (4 lessons: 1-4 only)	
Year 1	**Computing systems and networks**	**Programming 1**	**Creating media**	**Programming 2**	**Online safety**
	Improving mouse skills (3 lessons: 1-3 only)	Algorithms unplugged (4 lessons: 1, 2 , 4 and 5 only)	Digital imagery (3 lessons: 1-3 only)	Bee-bot (Option 1: Bee-Bot) (Option 2: Virtual Bee-Bot) (4 lessons: 1, 3, 4 and 5 only)	Online safety Y1 (All 4 lessons)
Year 2	**Computing systems and networks 1**	**Programming 1**	**Data Handling**	**Programming 2**	**Online safety**
	What is a computer? (3 lessons: 1, 2 and 5 only)	Algorithms and debugging (4 lessons: 1, 2, 4 and 5 only)	International Space Station (3 lessons: 1, 3 and 5 only)	ScratchJr (4 lessons: 1, 2, 4 and 5 only)	Online safety Y2 (All 4 lessons)
Year 3	**Computing systems and networks 1**	**Computing systems and networks 3**	**Creating media**	**Programming**	**Online safety**
	Networks (3 lessons: 1, 3 and 5 only)	Journey inside a computer (3 lessons: 1, 2 and 5 only)	Video trailers (Option 1: Using devices other than iPads) (Option 2: Using iPads) (4 lessons: 1-4 only)	Programming: Scratch (4 lessons: 1, 2, 3 and 5 only)	Online safety Y3 (4 lessons: Teach all five by combining lessons 4 and 5)

	Computing systems and networks	**Programming 1**	**Data Handling**	**Programming 2**	**Online safety**
Year 4	Collaborative learning (Option 1: Google) (Option 2: Microsoft Office 365) (4 lessons: 1, 3, 4 and 5)	Further coding with Scratch (3 lessons: 2-4 only)	Investigating weather (3 lessons: 1, 3, and 4)	Computational thinking (4 lessons: 1-4 only)	Online safety Y4 (4 lessons: 1, 2, 3 and 5)
	Computing systems and networks	**Data Handling**	**Creating media**	**Programming**	**Online safety**
Year 5	Search engines (4 lessons: 1-4)	Mars Rover 1 (3 lessons: 1, 2 and 4)	Stop motion animation (Option 1: Stop Motion Studio) (Option 2: with cameras) (4 lessons: 1-4)	Programming music (Option 1: Sonic Pi) (Option 2: Scratch) (4 lessons: 1-4)	Online safety Y5 (3 lessons: 1, 4 and 5)
	Computing systems and networks	**Data Handling**	**Creating media**	**Programming**	**Online safety**
Year 6	Bletchley Park (3 lessons: 1-3)	Big data 1 (4 lessons: 1, 3, 4 and 5)	History of Computers (3 lessons: 3-5)	Intro to Python (4 lessons: 1-4)	Online safety Y6 (4 lessons: 1, 2, 4 and 6)